MONITORING OF WILDLIFE CONTROL AREAS AND AVIFAUNA ON THE OLDMAN RIVER RESERVOIR

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Executive Summary

This report will focus on the effectiveness of the wildlife control areas, the incidence and severity of human disturbance and the occurrence of birds of prey and colonial nesting species in association with the Oldman River Dam.

The wildlife Control areas were established this year specifically to protect breeding pairs of Prairie Falcon *Falco mexicanus* and Golden Eagle *Aquila chrysaetos* nesting on the banks of the reservoir. These areas, the birds they contained and human activity were monitored throughout the breeding season. Less intensive monitoring was also carried out throughout the breeding season relative to Ferruginous Hawks *Buteo regalis*, Osprey *Pandion haliaetus*, Common Loons *Gavia immer*, and colonial species known to be sensitive to human interference.

In the current year approximately 600 hours were spent in the field monitoring the control areas and observing and recording human activities and the effect of these activities on sensitive species. Breeding territories of eight Prairie Falcon, one Golden Eagle, four Ferruginous Hawk, one Osprey and one Common Loon were occupied and monitored during the 1994 breeding season. Each territory contained breeding pairs that attempted to nest in the current breeding season. Of these five pair of Prairie Falcons successfully fledged a total of 23 young, 18 were caught and banded, the one pair of Common Loons hatched one youngster and two pair of Ferrugious Hawks producing young. In addition nesting territories of seventeen pair of Red-tail Hawk *Buteo jamaicensis*, one pair of Richardson's Merlin *Falco columbarius richardsoni*, four pair of American Kestrel *Falco spaverius*, one pair of Marsh Hawk *Circus cyaneus* and one pair of Swainson's Hawk *Buteo Swainsonii*, were recorded in or adjacent to the study area. No transgressions into the Wildlife Control

Areas were observed in over 200 recorded observations of boats and/or people approaching these areas. Correspondingly there was no indication of severe disturbance at any nest site once the breeding pairs were established. Of specific interest was the fact that both the Prairie Falcon and Golden Eagle territories delineated by buoys were subjected to regular activity of fishermen and motor boats passing immediately beyond the buoys with no apparent effect on the breeding birds. Although the Golden Eagles were not successful in fledging young, field observations suggest that the nesting failure of the eagles was a natural event and not the result of human interference. This is the first season since our monitoring began during which we have not recorded severe disturbance in relation to raptor nest sites. However, disturbance remains a concern as indicated by the fact that the two Prairie Falcon territories in close proximity to the Dam were subjected to considerable human activity immediately prior to the establishment of territories and although birds were observed in the territories no nesting attempt was recorded.

Seven artificial holes were occupied during the 1994 breeding season, four by Prairie Falcons, two by Great Horned Owls *Bubo virginianus* and one by Canada Geese *Branta canadensis*,. Four nesting platforms were also utilized, one each by Ferruginous Hawks, Red-tailed Hawks, Canada Geese and Osprey. Several nest boxes were occupied by American Kestrels, Barrow's Goldeneye *Bucephala islandica*, Mountain Bluebirds *Sailia currucoides*, and Tree Swallows *Tachycineta bicolor*.

1.0 INTRODUCTION

1.1 Background and Rationale

The construction and subsequent flooding of the Oldman River Dam impacted adversely on raptorial birds and other sensitive species nesting in, or adjacent to the reservoir. During the construction phase several pair of raptorial birds nesting in and adjacent to the Oldman, Crowsnest and Castle River valleys were displaced by human activity and habitat alteration associated with the construction and subsequent flooding of the Oldman River Dam[1]. In 1991-92 environmental hearings were held by a Federal Environmental Panel throughout the province. Several concerns were addressed and recommendations were made. This project has been initiated in response to concerns that were voiced and in response to the recommendation that the monitoring should be continued, relative to the newly created Wildlife Control Areas.

With the completion of the dam the majority sensitive species have now relocated to alternate natural and/or artificial nest sites in the area. In addition newly created nesting and feeding areas have attracted numbers of sensitive colonial water birds[2].

Following the completion of the dam, human activity has increased significantly and camping, fishing and other water-oriented recreational activities have the potential to subject the

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[1] Prairie Falcon *Falco mexicanus*, Ferruginous Hawk *Buteo regalis*, Red-tailed Hawk *Buteo jamaicensis*, American Kestrel *Falco sparverius* and Great Horned Owl *Bubo virginianus*.

[2] All of the following species have been observed on the reservoir and could begin to colonize: Canada Goose *Branta canadensis*, Common Tern *Sterna hirundo*, Black Tern *Chlidonias niger*, California Gull *Larus californicus*, Ring-billed Gull *Larus delawarensis*, Western Grebe *Aechmophorus occidentalis*, Eared Grebe *Podiceps caspicus*, Double-crested Cormorant *Phalacrocorax auritus*, White Pelican *Pelicanus erythrorhynchos*.

resident raptors, colonial birds, and other sensitive species to severe disturbance throughout the breeding season. As the potential for human interference is very real, Wildlife Control Areas were proposed in 1993 and put into effect in the spring of 1994. Further justification for the establishment of the Control Areas would include the following: a) the Oldman River Reservoir and surrounding area supports one of the principle concentrations of breeding birds of prey in Alberta,[3] This population is unique because it is both readily accessible and observable and therefore potentially subject to considerable human interference during the nesting season. b) it was decided that it was necessary to determine how effective these exclusion areas would be in preventing human interference during the breeding season , and c) the successful mitigation of these birds and the documented evidence in 1993 indicating the sensitivity of these birds to human interference.

2.0 Objectives

1. To monitor and evaluate the effectiveness of the Wildlife Control Areas in protecting breeding birds in designated areas associated with the Oldman River Dam and Reservoir.
2. To determine the occurrence and progress of nesting colonial waterfowl along the shoreline of the reservoir.
3. To document the incidence and severity of human disturbance associated with each nest and establish minimum acceptable tolerances of specific recreational activities adjacent to each nest.

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[3] The raptorial species breeding in the area include;Golden Eagle, Osprey, Prairie Falcons, Richardsons's Merlin, American Kestrel, Ferruginous Hawks, Red-tailed Hawks, Swainson's Hawks, Cooper Hawks, Sharp-shinned Hawks, Marsh Hawks, Great Horned Owls, Long-eared Owls, and Short-eared Owls. Peregrine Falcons formerly bred on the Castle River and Bald Eagles currently nest just north of the area.

4. To record biological data relative to the breeding biology, phenology and response to disturbance by raptorial and colonial water birds nesting in and associated with the area impacted by the construction and flooding of the Oldman River Dam.
5. To maintain public support through good public relations, i.e. keeping the local public informed, working closely with the government departments, the media, local committees, and where possible involving the public in activities related to the project.

3.0 Methods

3.1 Field Observations:

3.1.1 Monitoring nesting raptorial birds in the newly assigned Wildlife Protection Areas

The primary focus of this project is to monitor the effectiveness of the exclusion areas in protecting breeding birds within these areas. Monitoring was carried out from the beginning of April through early July for both raptors and colonial species in order to provide data on initial occupancy and the extent of human interference at this critical time. Within the Wildlife Control Areas once nesting territories were established and nesting was initiated we made daily visits (weather and roads permitting) to observe the breeding birds and to record any instance of disturbance. All known nest sites were visited regularly and relevant observations recorded and problems investigated. Specific attention was paid to areas with high recreational traffic and all observed interaction recorded.

To measure the effects of human interference the frequency, timing, duration, and location of each type of recreational activity carried out near nesting areas of sensitive species was documented. All instances of human interference were recorded as well as data relative to the response of the breeding birds to specific types of disturbance. Also noted when possible were the effects of the various types of human activity in relation to the breeding birds with specific reference to the nature of the activity, the relative distance from nest sites and the response of these birds in relation to the timing in the breeding cycle.

In order to provide the necessary biological data, data was kept on all bird species observed in the area. This documentation included; arrival dates, initiation of nesting, egg laying hatching and fledging dates and interaction with other species..

Immature Prairie Falcons and were banded and field monitoring was continued until the fledging of the young.

3.1.2 Inventory of Breeding Birds of Prey

Raptor breeding inventories and behavioural studies have been carried out each year from March through July in 1989 through 1994. These field investigations were carried out specifically to locate breeding pairs, non breeding pairs and individuals occupying known breeding territories, or suitable nesting habitat within 16 km. of the proposed reservoir boundaries.

3.1.3 Banding

Banding of Prairie Falcons and Ferruginous Hawks in the study area began in 1989 using standard USF&W numbered aluminium bands has continued to the present . In 1989 and 1990 the falcons in the study area were also banded with combinations of red, blue and black coloured bands, however banding in 1991, 1992, 1993 and 1994 banding has been carried out using only the standard USF&W aluminium bands.

3.2 Inventory of Colonial and Sensitive Species

Throughout the season colonial and other sensitive species were also inventoried and their nests plotted. With the influx of other species into the area, species composition is somewhat volatile

and considerable time was spent monitoring new arrivals. Particular attention was paid to those species attempting to nest in the area for the first time.

3.3 Monitoring the effect of Human Disturbance

One of the objectives of the current study has been to determine the effects of disturbance on the Prairie Falcons and Golden Eagles nesting in the Control Areas. This is of particular relevance as earlier studies have documented adverse affects on these two species resulting from various types of disturbance (Fyfe and Olendorff 1976, Call 1978, White and Thurow 1985, Grier and Fyfe 1987).

In order to determine the effect of human disturbance three priorities were set:

1. To determine initial occupancy of the nesting falcons and eagles in the Control Areas. This period is the most critical time for the establishment of territories by raptors and for the initiation of colonization by colonial species.
2. To document the general biology and to monitor natural disturbance affecting the breeding birds. When possible early in the nesting season these areas were monitored daily,.. This monitoring was carried out intensively through hatching of the young and less intensively through fledging for all sites in the control areas. Less intensive monitoring was also carried out throughout the breeding season relative to Ferruginous Hawks *Buteo regalis*, Osprey *Pandion haliaetus*, Common Loons *Gavia immer*, and colonials species known to be sensitive to human interference.
3. To document interaction with humans in or adjacent to the Control Areas regardless of the nature of the interaction. Specifically we attempted to determine the relative response by breeding birds

to various types of activities in relation to the time in the birds breeding cycle and in relation to such aspects as distance, timing, duration and nature of the activity. When possible early in the nesting season these areas were monitored daily, and following hatching on alternate days. Less intensive monitoring was also carried out throughout the breeding season relative to Ferruginous Hawks *Buteo regalis*, Osprey *Pandion haliaetus*, Common Loons *Gavia immer*, and colonials species known to be sensitive to human interference.

During the current season the most intensive monitoring was done in relation to the control areas while other areas were monitored to a lesser degree.

All observed instances of disturbance and the subsequent behaviour have been documented since 1989. Our procedures have been the same each year and we have simply taken every opportunity to document any disturbance that we observed that could be associated nest desertion. We did not attempt to stop any disturbance encountered nor to interfere with any observed problem. Our observations of the activities and the subsequent results were simply documented and reported.

4.0 RESULTS

4.1 Raptor Population Inventory

Prairie Falcons were observed in ten of thirteen available nesting territories during the 1994 breeding season, however, no attempt was made at nesting in two known territories although birds were observed at or near these territories very early in the season.

Four of six Prairie Falcon territories located in the Wildlife Control Areas were occupied during the current year. These include all of the territories still available on the reservoir itself. Three of the four were successful in fledging young. One site failed when the young were approximately three weeks of age. Four of six additional known prairie Falcon Territories in close proximity to the reservoir were occupied this year.

The Golden Eagle territory located in the Wildlife Control Area was occupied again this year. The pair were observed during courtship, nest building and incubation through hatching.

Ferruginous Hawks were observed in one territory adjacent to the reservoir and in three of four nesting territories outside of limits of the proposed reservoir but within the study area. Four pair occupied territories and nested two pair were successful in hatching young.

In addition nesting territories of seventeen pair of Red-tail Hawk, one pair of Richardson's Merlin, four pair of American Kestrel, one pair of Marsh Hawk and one pair of Swainson's Hawk, were recorded in or adjacent to the study area.

4.1.1 Prairie Falcon Production

Twenty three young Prairie Falcons were produced by five productive pair (Table 1.) for an average of 3.8 young per productive pair, or an average of 2.8 young for eight nesting attempts. One nest failed possibly due to predation. Our observations suggest that it is possible that the two pair of falcons immediately below the dam made no attempt at nesting as a result of the human activity in the area just prior to the nesting season..

4.1.2 Ferruginous Hawk Production

During the current year four pair of Ferruginous hawks were found breeding. One pair was found nesting in one of the platforms that had been erected adjacent to the reservoir. It is believed that this pair had simply relocated roughly 2 km. from a former nesting territory. This pair was observed on several occasions and although the exact number of young could not be identified it was definite that there were young on the nesting platform in late June. Two pair succeeded in producing young.

4.1.3 Banding

Eighteen nestling Prairie Falcons were captured and banded using regular USF&W lock-on bands (Table 3.). This brings the total to one hundred ninety Prairie Falcons that have been banded in the

past five years with ninety seven colour marked (Table 4.). The total includes the nineteen adults caught and individually marked.

TABLE 1.

	1994 IMMATURE PRAIRIE FALCON BANDING		
Location	Male	Female	Date
Days	816-16067 816-16068 816-16069		06-18-94
Langs	816-16071	987-46359 987-46360 987-46361	06-18-94
1st Porcupine	816-16070		06-18-94
Buffalo Jump	816-16060 816-16061 816-16062 816-16063 816-16064		06-18-94
Castle	816-16065 816-16066	987-46356 987-46357 987-46358	06-19-93

No young Ferruginous were banded in the current year. Small young were observed in two nests but rain and difficult climbing conditions made it impossible for us to band these young when we did our banding run.

4.2 Inventory of Colonial birds and other Sensitive Species.

In the current year the following colonial species were observed in the area:

Western Grebes were first observed on April 26 and were subsequently observed in several areas of the reservoir. During the current year they remained for only a few weeks at most. We did not observe any attempt at nesting.

Double-crested Cormorants were first observed flying over the reservoir on April 28 and were seen almost daily thereafter throughout the breeding season. The majority of these birds were non breeders and although no attempt at nesting was observed a single bird was observed carrying sticks in late June and considerable time was spent on the dead trees at the east end of Stevick's. As Cormorants are known to nest in trees it is possible that they will attempt to nest here in future years. Although some time was spent on the rocky islands there was no indication of courtship or nest building.

White Pelicans were first observed flying over the reservoir May 29, although seen on and flying over the reservoir it is believed these were non-breeding birds or birds breeding elsewhere and coming to the reservoir to feed.

The one sensitive species of note was the Common Loon. These birds were first observed on the reservoir on May 2. Individuals were observed in several areas on all three arms of the reservoir and one pair established a breeding territory and nested on one of the Stevick Ponds. California Gulls, Common Terns, and Black terns were observed on the reservoir on different occasions but appeared to be using the area as a loafing and or feeding area only.

4.3 Disturbance

As in other years all breeding pairs were subject to a wide range of natural disturbance and varying degrees of human related disturbance. However, following the implementation of the

Wildlife Control Areas and the placement of the signs we did not record a single instance of transgression into the areas that had be marked as off-limits to the public. The implementation of the Control Areas restricted direct access to nesting birds, power boats, fishermen, and picnickers but otherwise people were free to move wherever they wished.

TABLE 2.

PRODUCTIVITY AND DISTURBANCE AT KNOWN PRAIRIE FALCON BREEDING TERRITORIES FOR 1994

NEST SITE	1985 NEST # (Young et al. 1986	PRODUCTIVE IN 1994	DISTURBANCE
Old Bridge	#48	N	Minimal
Mercury	#45	N	Severe[1]
Dam[1]	#42	N	Severe[1]
Buffalo Jump E.	#40	Y	Minimal
Buffalo Jump W.[2]		N	Minimal
Fairbrother		N	Minimal
Lang		N	Minimal
Days		Y	Moderate
1st Porcupine[R]		Y	Minimal
Maloff	#12	N	Minimal
Castle[R2]		Y	Minimal

[1] suspected relocation from former #42
[2] second nest site within an established territory
[R] pair relocated from Days.

PRODUCTIVE = Indicates whether a nest site was productive or not in the 1994 season
DISTURBANCE = relative level of documented disturbance
NEST SITE = Names given to known breeding territories
= Corresponds to nest numbers given in earlier reports by Young

In contrast to 1993 the incidence of disturbance to breeding raptors was greatly reduced. Our observations suggest only minimal to moderate disturbance at any nesting site on the reservoir. In

contrast those nest sites just downstream of the dam were subjected to considerable human interference prior to the nesting season and both failed to nest. It was interesting to note that falcons were again observed at both nests prior to the breeding season but apparently made no attempt to nest in 1994.

Ferruginous Hawks were observed at three previously occupied territories and also in one new territory in the study area in 1994. Pairs were observed at nests in all four territories early in the season, however only two of the four pair in the study area were successful during the 1994 breeding season. As in the past three years the Ferruginous in the study area have been subjected to little human interference and our observations suggest that their production has not been influenced by disturbance.

4.4 Artificial Nest Utilization

Table 7. summarizes the utilization of the artificial cliff nesting sites since 1989. Seven artificial holes were occupied during the 1994 breeding season, four by Prairie Falcons, two by Great Horned Owls and one by Canada Geese. Three of the four Prairie Falcons and both the geese and the owls nested successfully. One pair of falcons deserted due to unknown causes.

Prior to the 1991 breeding season nineteen nest platforms were constructed and placed on tree stumps or poles in selected sites along the banks of the reservoir or on areas destined to become islands with the flooding of the reservoir. In 1994 three platforms were used successfully, one by a breeding pair of Red-tailed Hawks and two others by Canada Geese. In addition a pair of Osprey

made a definite attempt at nesting on one platform and were subsequently observed regularly on this platform and the other three platforms at Stevick's throughout May, June and into early July.

Table 3. **ARTIFICIAL AND IMPROVED CLIFF NESTING SITES 1989 -1994**

	Artificial holes	Utilized by Prairie Falcons	Utilized by other species	Total Occupied
Available in 1989	15	1	1 Raven 1 Canada Goose	3
Available in 1990	+32 = 47	3	1 Canada Goose 1 G.H.Owl	5
Available in 1991	+3 = 50	4	2 Canada Geese 1 G.H. Owl	7
Available in 1992	50	3	1 Canada Goose 1 G.H. Owl 1 Raven	6
Available in 1993	+1 = 51	5	1 Canada Goose 1 G.H.Owl	7
Available in 1994	= 51	4	1 Canada Goose 2 G.H.Owl	7
Total	51	20	15	35

Although we were not able to monitor all of the nest boxes we did document Kestrel pairs using three boxes, and observed Barrow's Goldeneye investigating several boxes. Lone drakes were later observed loafing near several boxes suggesting that the Barrow's Goldeneye did indeed nest in some of the boxes.

5.0 DISCUSSION

5.1 Wildlife Control Areas.

Following the desertion of nesting Golden Eagles and Prairie Falcons due to human interference in 1993, seven Wildlife Control Areas were proposed for the Oldman River Reservoir. This proposal was put forward to protect nesting birds of prey (specifically Prairie Falcons and Golden Eagle) and other wildlife nesting on the banks of the reservoir or immediately downstream of the Dam itself.

Six of seven control areas on the Oldman River Reservoir were established specifically to protect nesting birds of prey. In 1994 the areas were demarked, legislation was put forward and this project was subsequently undertaken to determine their effectiveness in protecting the breeding birds of prey. Four of the control areas were utilized in the 1994 breeding season, three by Prairie Falcons and the fourth by the pair of Golden Eagles. In addition the pair of Prairie Falcons normally utilizing the cliffs at the Stevick's East Control Area relocated approximately 1 km. south and nested in an artificial hole just outside of the area included in the control area designation.

Of the over 200 observations of boats and/or people near the designated areas we did not observe a single transgression into the areas that were delimited by the buoys or markers. Although the pair of eagles did fail to fledge young there is no evidence to indicate the failure was due to human interference. Our observations confirmed that the pair occupied the territory, built a new nest, copulated and laid. Incubation progressed through hatching despite frequent movements of boats passing just outside the buoys. Within a day or so of hatching it appears the youngster died of natural

causes and we became aware of the death when we observed the strange behaviour of the adult chasing a magpie from the side of the nest. We did not see the magpie on the structure but observed several attempts to get at something in the nest. The behaviour of the adult eagle indicated that clearly it no longer had either eggs or a live chick in the nest as it moved normally from one side of the nest to the other chasing the magpie. Had their been an egg or live chick the adult eagle would have been inhibited by the innate limp-footed behaviour each time they approach either eggs or chicks. The adult eagle did not exhibit this behaviour suggesting that the chick was already dead and that the magpie was attempting to get what appeared to be a piece of carrion. We later verified that there had been a chick by viewing the nest from about 10 meters with binoculars and observing two pieces of skin with attached down in the nest.

5.1.1 Prairie Falcons

Prairie Falcons were observed in all of the control areas where nesting territories had been known previously. However, pairs established in only four of these areas (including the pair that relocated just outside of the control area at Stevick's) Three of the four pair successfully fledged young during the current breeding season.

For the entire study area Prairie Falcons were observed in a total of ten territories in the 1994 breeding season. Eight territories were occupied by breeding pairs but only five succeeded in fledging young. Production was excellent for these few productive pairs. The resulting fledging success of 3.8 young per successful pair of Prairie Falcons is well above what is normally considered good fledging

TABLE 4. PRAIRIE FALCON BREEDING TERRITORIES

1989, 1990, 1991, 1992, 1993,1994

NEST SITE	PRS 89 90 91 92 93 94	IND 89 90 91 92 93 94	COURT 89 90 91 92 93 94	COP 89 90 91 92 93 94	EGGS 89 90 91 92 93 94	YNG FL 89 90 91 92 93 94
Old Bridge	Y Y Y Y Y Y		Y Y Y Y Y Y	Y Y Y	5 5	4 4 5
Mercury	Y Y Y Y^		Y Y		4 4	4 3
Dam[1]	Y	Y	Y			
Buffalo Jump E.	Y Y Y Y Y Y		Y Y Y	Y Y	5	4 5 4 5 5
Buffalo Jump W.	Y Y Y Y Y		Y Y Y Y Y	Y Y Y Y	3 3 3	
Fairbrother	Y Y Y Y Y Y		Y Y		5 5	3 3 3 5 5
Bitango Eagle	Y		Y			4
Bitango Bridge	Y Y		Y			5
Tennessee Creek	Y Y Y	Y			4	4 4
Lang	Y Y Y Y Y	Y Y	Y Y Y	Y Y	3	1 5 4
Welsch	Y Y Y	Y	Y Y		4	4 4
Days	Y Y Y Y Y		Y	Y	5	2 3 3
1st Porcupine[R]	Y Y Y Y Y		Y Y Y	Y		5 4 5 5 1
Double Ox-bow	Y Y Y	Y	Y		Y[4]	
Horseshoe	Y Y Y Y		Y	Y	5 4	4 4 3 5
Horseshoe#2	Y					2 2
Maloff	Y Y Y Y Y Y		Y Y	Y	4	3 4 1
Stevick	Y Y	Y Y Y			5	5 5
Castle Dairy	Y Y Y Y		Y	Y	5 3 5	4 4 4 5

[1] suspected relocation from former #42
[2] second nest site within an established territory
[R] pair relocated from Days
[4] female observed incubating
[^] alternate site in same territory

NEST SITE = Names given to known breeding territories
PRS = pairs observed on territory
IND = individual birds observed to remain in a territory
COURT = courtship behaviour observed
COP = copulation observed
EGGS = number observed, most nests not climbed in incubation
YNG FL = number of young known to have fledged

success (3.1 or 3.2 per successful pair as reported in Idaho by Ogden and Hornocker (1977) and the Pawnee Grassland in Colorado by Olendorff (1973)). Unfortunately the overall production is down to 2.8 with only six of the eight nesting attempts succeeding. Fortunately neither of the two nest failures appears to have been related to human interference as both sites are relatively inaccessible and at no time during the season did we observe people at or near the nests.

5.1.2 Ferruginous Hawks

In 1985 a single pair of Ferruginous hawks was recorded nesting in the area to be impacted by construction activity. After relocating twice, this pair has nested each year since 1989 at a site approximately four kilometres from the dam. In 1990 and 1991 Ferruginous were recorded at two other locations within the study area but away from the reservoir. Then in 1992 and again in 1993 new pairs established territories and nested within the study area but again away from the reservoir. This brought the total Ferruginous nesting in the study area to five all nesting some distance from the reservoir.

TABLE 5. FERRUG INOUS HAWK BREEDING TERRITORIES 1989, 1990, 1991, 1992, 1993, 1994

NEST SITE	PRS 89 90 91 92 93 94	IND 89 90 91 92 93 94	COURT 89 90 91 92 93 94	COP 89 90 91 92 93 94	YNG FL 88 90 91 92 93 94
Feedlot	Y	Y		Y	
Highway	Y Y Y Y Y Y		Y Y Y		3 2 2 3 2
1St Porcupine[1]	Y Y Y Y		Y Y Y	Y Y Y	3 Y
Porcupine #2	Y Y Y Y Y		Y Y Y	Y	3 4 4 4 Y
Porcupine #3	Y		Y		
Porcupine #4	Y Y Y				2

1 this pair appears to have relocated from 1st Porcupine to this platform beside reservoir.

Then in the 1994 field season a pair of Ferruginous Hawks were observed utilizing one of the nest platforms immediately adjacent to the reservoir. It appears that this pair relocated roughly 1.5 km from their former nesting territory on 1st Porcupine. Three other pair of Ferruginous were located in former nesting territories within the study area. Of the four nesting pair located in 1994 two succeeded in producing young and two pair failed and deserted the territories in mid June. Adverse weather conditions and the difficulty of access prevented any attempt at banding Ferruginous Hawk young this year.

As in the previous three years our observations indicate that the Ferruginous Hawks within the study area have been subjected to a minimum of human disturbance. We have found no evidence to suggest that human interference has in any way affected the nest success of these birds during the past four years.

5.2 Colonial and Sensitive Species

During the 1994 breeding season Western Grebes, Double-crested Cormorants, Common Tern, Black Tern, White Pelicans and Common Loons were all observed on or adjacent to the reservoir. Of these only the Common Loon and Double-crested Cormorants remained throughout the breeding season and both species, loons and cormorants, were observed at several locations on the reservoir. However, they were primarily associated with the ponds at Stevick's and it was here the Common Loons were found nesting. The pair were incubating in June and we believe we observed a single young with an adult early in July. The success of this pair is encouraging since it is

the first year these birds have attempted to nest on the reservoir because they were subject to some disturbance during incubation and remained to successfully hatch a single youngster.

The majority of the Cormorants birds were non breeders and no nesting attempts were observed. However, these birds spent considerable time on the dead trees at the east end of Stevick's and on one occasion in late June a single bird was observed carrying sticks. As Cormorants are known to nest in trees it is possible that they will attempt to nest here in future years.

The White Pelicans observed flying over the reservoir were probably non-breeding birds, or birds that were breeding elsewhere and were simply coming to the reservoir to feed.

The California Gulls, Common Terns and Black terns observed on the reservoir appeared to be using the area as a loafing and/or feeding area only..

5.3 Disturbance

In the 1989 report I suggested that next to the actual destruction of nest sites by flooding, the most serious problem for both the Prairie Falcon and the Ferruginous Hawks would probably be disturbance. Unfortunately until this year in each of the subsequent years, disturbance was demonstrated as the most serious problem for these and other sensitive species nesting in the study area. As in previous years during the current year we have taken every opportunity to document any disturbance that could be associated to nest desertion, however as in the past we did not attempt to stop such disturbance when encountered nor to interfere with any observed problem. Our observations of the activities and the subsequent results were simply documented and reported.

Our observations suggest that in general, human interference was minimal during the current year, and I am pleased to be able to report that for the first time since 1989 we can report that we did not record a single desertion by raptors or other sensitive species as a result of human interference. Our observations suggest that the public respected the Wildlife Control Areas during the extent of the breeding season and our field observations indicate that both the falcons and eagles nesting in the control areas were not subjected to any serious disturbance from people.

TABLE 6. PRODUCTIVITY AND DISTURBANCE AT KNOWN FERRUGINOUS BREEDING TERRITORIES -1989, 1990, 1991, 1992, 1993,1994

NEST SITE	1985 NEST #	NEST SUCCESS 1989 1990 1991 1992 1993	DISTURBANCE
Feedlot		not occupied	Minimal
Highway[1]	#47	Y Y Y Y Y	Minimal
Porcupine Hill		N N Y Y	Minimal
Porcupine #2		Y Y Y Y Y	Minimal
Porcupine #3		Y N	Minimal
Porcupine #4		N	Minimal

[1] suspected relocation from former #42

[2] second nest site within an established territory

NEST SITE = Names given to known breeding territories
= Corresponds to nest numbers given in earlier reports by Young et al 1986
NEST SUCCESS = Indicates whether a nest site was productive or not
DISTURBANCE = relative level of documented disturbance

During the current breeding season, the most serious human interference affecting raptors occurred unwittingly prior to the breeding season at the two sites immediately downstream from the dam. Some disturbance occurred relative to nesting loons and the non breeding cormorants at Stevick's.

Both are sensitive species and both species were inadvertently flushed on several occasions as a result of people fishing or walking at the edge of the western lakes. I do not think this was serious disturbance as the cormorants were still present and utilizing the trees for perching at that time and we believe we observed a single chick with one of the adult loons in early July.

5.4 Artificial Nest Sites

As noted in 1993, following the flooding of the reservoir several of the original nest sites are no longer available. However, for those territories where nest sites have remained or where artificial sites are available the breeding pairs returned and utilized both natural and artificial holes in their original territories. Other pairs either relocated or returned to old territories outside of the reservoir. A total of seven artificial holes were occupied during the current breeding season, four by Prairie Falcons, one by Canada Geese and two by Great Horned Owls.

Four nesting platforms were also utilized for nesting in 1994, one each by Ferruginous Hawks, Red-tailed Hawks, Canada Geese and Osprey and several others were utilized as feeding platforms and hunting perches Ospreys were observed frequently using the poles as perch points in May and early June of the current year.

Wooden nest boxes placed adjacent to the reservoir provided suitable nests for American Kestrels, other hole nesting species, and several species of tree nesting waterfowl. We did not make a serious attempt to monitor all of the nest boxes in the 1993 breeding season. .. Several nest boxes were occupied by American Kestrels, Barrow's Goldeneye *Bucephala islandica*, Mountain Bluebirds *Sailia currucoides*, and Tree Swallows *Tachycineta bicolor*. We did document Kestrel pairs at three

boxes and we observed lone drake Barrow's Goldeneye near others. It is probable that all represented nesting females using the boxes.

As stated in my 1992 report "It is my opinion the most serious impact on not only the raptors but on any colonial nesting waterfowl or other sensitive colonial nesting birds is yet to come. I believe this impact will come from human disturbance resulting from unrestricted recreational activities on the reservoir". While this may still be the case I am pleased to note that the implementation of Wildlife Control Area had a very definite influence on the activities of the public as noted we did not record a single transgression by the public into these areas. It is also evident that if people stay in their boats and away from sensitive areas they do not pose a threat and even the very sensitive species tolerated activity outside of the exclusion areas. Hopefully the implementation of these areas will have averted the very real possibility that the majority of the more sensitive species will abandon the area. This would to some extent have nullified the mitigation work and would certainly have resulted in the loss of the breeding pair of Golden Eagle, several pair of Prairie Falcons, Ferruginous Hawks and Long-billed Curlew and would have virtually eliminated the potential for establishing several of the colonial species.

6.0 RECOMMENDATIONS

1. I recommend that, if possible, the two Wildlife Control Areas below the Dam be enforced no later than March 15 through the end of April each year. This would provide the prairie falcons the opportunity to establish territories as a result of freedom from disturbance during this critical period. Once the birds have established and nested, the regulations could be relaxed and people could travel and fish on the opposite side of the river. I believe this would provide sufficient time for the birds to establish and would allow them to complete the breeding cycle.

2 In order to provide a relatively disturbance free environment during nesting and incubation for the falcons, osprey, loons and cormorants. I recommend that public access be restricted to the existing roads and to post a sign asking the public to refrain from walking beyond the top of the hill behind the picnic site .

3. Where possible, it would be desirable to co-ordinate planned recreational activities to minimize disturbance and maximize the recreation and educational potential of the breeding raptors and colonial species.

4. I recommend the establishment of an observation shelter and information board in one of the recreational areas, where the public can observe the Prairie Falcons, Osprey or Red-tailed Hawks through spotting scopes.

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Appendix 1. Summary of Oldman Prairie Falcon Nest Data

	OLDMAN RIVER PRAIRIE FALCON NEST OCCUPANCY 1968 - 1994																				
	68	69	70	71	72	73	74	75	76	77	78	80	85	86	87	89	90	91	92	93	9
OB	F	F	O	F	F	F							F	F	F	S	F	F	F	F	F
ME	F	F	F	S		F		F	F	F	F	F	F	F	F	F	F	F		F	
DAM			F	F			F				F	F	S	S		F		O		S	
BJE	F	F					F		F	F	F	S	F	F	F	F	F	F	F	F	F
BJW														U	U	F	F	F	F	F	
BBR													F	F	F	F	F	O			
BEA														U	U		F				
TEN														U	U	S	F	F	F		
LAN	F	F	O	O	O	O	O	O	O	O	O			U	U	F	F	F	S	F	F
WEL					F	F	O	F	O	F	F		F	U	U	F	F	F	S		
HO1							F	F	F	F	S		F	U	U	F	P	F	P		
HO2																	F				
MAL							F	F	F	F			F	U	U	F	F	F	F	F	F
CD																F	F	F	O	O	FA
STE																	S	S	F	F	O
DAY																F				F	F
IP																	F	F	F	F	F
DOX													F			F		F	S		
FA		F	F	F	F	F	F	F	F	F	F	F	U			F	F	F	F	F	F

#F	4	5	3	4	2	4	5	5	5	6	6	4	8	5?	4?	15	13	13	12	10	8
#S						1					1	1	1	1			3	1	3	1	
#O			2	1	1	1	2	1	2	1	1							2	1	1	2

F - Pair of Prairie Falcons on territory
S - A single Prairie Falcon on territory
O - Pair of Great Horned Owls nesting in the territory
Shading - 7 Prairie Falcon territories flooded by the reservoir

APPENDIX 3. Birds identified in the study area 1989-94

Western Grebe *Aechmophorus occidentalis*
Red-necked Grebe *Podiceps grisegena*
Eared Grebe *Podiceps caspicus*
Horned Grebe *Podiceps auritus*
Double-crested Cormorant *Phalacrocorax auritus*
Great Blue Heron *Ardea herodias*
Whistling Swan *Cygnus columbianus*
Trumpeter Swan *Cygnus buccinator*
Canada Goose *Branta canadensis*
Snow Goose *Chen hyperborea*
Mallard *Anas platyrhynchos*
Gadwall *Anas strepera*
Northern Pintail *Anus acuta*
Green-winged Teal *Anas carolinensis*
Blue-winged Teal *Anus discors*
Cinnamon Teal *Anas cyanoptera*
American Widgeon *Mereca americana*
Shoveler *Spatula clypeata*
Wood Duck *Aix sponsa*
Canvasback *Aythya valisineria*
Ring-neck Duck *Aythya collaris*
Lesser Scaup *Aythya affinis*
Barrow's Goldeneye *Bucephala islandica*
Common Goldeneye *Bucephala clangula6*
Bufflehead *Bucephala albeola*
White-winged Scoter *Melanitta deglandi*
Ruddy Duck *Oxyura jamaincensis*
Common Merganser *Mergus merganser*
Red-breasted Merganser *Mergus serrator*
Hooded Merganser *Lophodytes cucullatus*
Sora Rail *Porzana carolina*
American Coot *Fulica americana*
Killdeer *Charadrius vociferus*
Greater Yellowlegs *Tringa melanoleuca*
Spotted Sandpiper *Actitis macularia*
Marbled Godwit *Limosa fedoa*
Willet *Catoptrophorus semipalmatus*
Wilson Phalarope *Phalaropus tricolor*
Long-billed Curlew *Numenius americanus*
California Gull *Larus californicus*
Ring-billed Gull *Larus delawarensis*

Common Tern *Sterna hirundo*
Black Tern *Chlidonias niger6*
Sharp-shinned Hawk *Accipiter striatus*
Cooper Hawk *Accipiter cooperii*
Goshawk *Accipiter gentilis*
Red-tailed Hawk *Buteo jamaicensis*
Swainson Hawk *Buteo swainsoni*
Rough-legged Hawk *Buteo lagopus*
Ferruginous Hawk *Buteo regalis*
Golden Eagle *Aquila chrysaetos*
Bald Eagle *Haliaeetus leucocephalus*
Northern Harrier *Circus cyaneus*
Osprey *Pandion haliaetus*
Prairie Falcon *Falco mexicanus*
Peregrine Falcon *Falco peregrinus*
Richardson's Merlin *Falco columbarius richardsoni*
American Kestrel *Falco sparverius*
Grey Partridge *Perdix perdix*
Mourning Dove *Zenaida marcroura*
Rock Dove *Columa livia*
Great Horned Owl *Bubo virginianus*
Short-eared Owl *Asio flammeus*
Long-eared Owl *Asio otis*
Burrowing Owl *Athene cunicularia*
Common Nighthawk *Chordeiles minor*
Ruby-throated Hummingbird *Archilochus colubris*
Belted Kingfisher *Ceryle alcyon*
Common Flicker *Colaptes cafer*
Hairy Woodpecker *Dendrocopos villosus*
Downy Woodpecker *Picoides pubescens*
Yellow-bellied Sapsucker *Sphyrapicus varius*
Eastern Kingbird *Tyrannus tyrannus*
Western Kingbird *Tyrannus verticalis*
Say's Phoebe *Sayornis saya*
Western Wood Pewee *Contopus sordidulus*
Least Flycatcher *Empidomax minimus*
Horned Lark *Eremophila alpestris*
Tree Swallow *Tachycineta bicolor*
Northern Rough-winged Swallow *Stelgidopteryx serripennis*
Bank Swallow *Riparia riparia*
Barn Swallow *Hirundo rustica*
Cliff Swallow *Petrochelidon pyrrhonota*
Common Raven *Corvus corax*

Common Crow *Corvus brachyrhynchos*
Black-billed Magpie *Pica pica*
Gray Jay *Perisoreus canadensis*
Clark's Nutcracker *Nucifraga columbiana*
Black-capped Chickadee *Parus atricapillus*
Red-breasted Nuthatch *Sitta canadensis*
Rock Wren *Salpinctes obsoletus*
House Wren *Troglodytes aedon*
Catbird *Dumetella carolinensis*
American Robin *Turdus migratorius*
Veery *Hylocichla fuscescens*
Mountain Bluebird *Sialia currucoides*
Ruby-crowned Kinglet *Regulus calendula*
Sprague's Pipit *Anthus spragueii*
Bohemian Waxwing *Bombycilla garrulus*
Cedar Waxwing *Bombycilla cedrorum*
Northern Shrike *Lanius excubitor*
Starling *Sturus vulgaris*
Yellow Warbler *Dendroica petechia*
Common Yellowthroat *Geothlypis trichas*
Yellow-rumped Warbler *Dendroica coronata*
Red-winged Blackbird *Agelaius phoeniceus*
Yelow-headed Blackbird *Xanthocephalus xanthocephalus*
Brewer's Blackbird *Euphagus cyanocephalus*
Western Meadowlark *Sturnella neglecta*
Common Grackel *Quiscalus quiscula*
Brown-headed Cowbird *Molothrus ater*
Vesper Sparrow *Pooecetes gramineus*
Savannah Sparrow *Passerculus sandwichensis*
Clay-colored Sparrow *Spizella pallida*
Dark-eyed Junco *Junco hyemalis*
Pine Siskin *Spinus pinus*
American Goldfinch *Spinus tristis*

APPENDIX 3. Dates of first sighting of Migrants 1989 -1994

Species	1989	1990	1991	1992	1993	1994	Early Arrival
Common Loon				May 15	June 16	May 2	May 2
Western Grebe		May 1	May 4		May 17	April 26	April 26
Eared Grebe		May 1	April 27				April 27
Horned Grebe				April 20		April 26	April 20
Double-crested Cormorant		May 15				April 28	April 28
Golden Eagle *	April 6	Feb 27	March 18	March 21	April 4	March 11	Feb 27
Bald Eagle		Feb 27	April 6	March 25		March 29	Feb 27
Osprey		April 19	April 22	May 29	May 18	April 13	April 13
Prairie Falcon *	March 9	Feb 26	March 18	March 21	April 4	March 11	Feb 26
Richardson's Merlin *	March 9	April 17	April 18		April 4	March 12	March 9
American Kestrel	March 25	April 16	April 7	March 31	April 4	April 18	March 25
Red-tailed Hawk	March 10	April 3	April 6	March 24	April 4	March 11	March 10
Ferruginous Hawk	March 31	April 17	April 13	March 27	April 4	March 29	March 27
Swainson's Hawk	May 1	April 24	April 22			April 15	April 22
Rough-legged Hawk *	March 31	April 25	April 13			March 11	March 11
Goshawk *	March 25		April 8				March 25
Sharp-shinned Hawk		April 30	April 23	April 15			April 15
Northern Harrier	April 5	April 16	April 7	March 31	April 8	March 29	March 29
Burrowing Owl				May 26			May 26
Short-eared Owl						April 30	April 11
Canada Goose *	March 9	March 6	March 18	March 21	April 4	March 11	March 6
Snow Goose	May 1		May 4			April 29	April 29
Whistling Swan	March 10				April 4	April 10	April 4
Trumpeter Swan					April 14		April 14
Common Merganser	March 30			March 29	April 4	March 29	March 29
Red-breasted Merganser	April 7				April 4		April 4
Hooded Merganser				May 13	May 17	April 18	April 18
Lesser Scaup		May 1		May 14			May 1

Species	1989	1990	1991	1992	1993	1994	Early Arrival
Ring-necked Duck		July 11				April 26	April 26
White-winged Scoter		July 11					July 11
Common Goldeneye			April 13	March 25	April 4	March 29	March 25
Barrow's Goldeneye				April 14	April 12	April 17	April 12
Bufflehead Duck			April 13	March 29	April 4	April 27	March 29
Canvasback			May 16	April 20	May 18		April 20
Redhead Duck						April 26	April 26
Mallard Duck *			April 6	March 21	April 4	March 11	March 11
Pintail Duck	April 5		April 6	March 21	April 4	March 28	March 21
American Widgeon		May 1	May 6	March 25	April 4	March 28	March 25
Green-winged Teal				April 6		April 17	April 16
Blue-winged Teal		May 1	April 25			April 19	April 19
Cinnamon Teal		May 1	April 19				April 19
Shoveler				April 20	April 4		April 4
Gadwall		May 1	May 16	May 14			May 1
Wood Duck	April 15		May 15	May 14	April 29		April 14
Ruddy Duck		July 11				April 26	April 26
Great-blue Heron	April 6	April 25	April 7	April 5	April 18	March 30	March 30
California Gull	March 25					April 10	March 25
Long-billed Curlew	May 2	April 18	April 20	April 16	April 28	April 24	April 16
Willet	May 12						May 12
Wilson Phalarope			May 1				May 1
Killdeer Plover	March 25	March 26	March 18	March 25	April 7	March 11	March 11
Spotted Sandpiper	May 10	June 12					May 10
American Coot				May 14			May 14
Black Tern				May 14			May 14
Belted Kingfisher	May 2	April 19			May 19	April 28	May 2
Bohemian Waxwing	April 5				April 7		April 5
Cedar Waxwing		June 7					June 7

Species	1989	1990	1991	1992	1993	1994	Early Arrival
Ruby-throated Hummingbird	May 10					May 14	May 10
Mourning Dove	May 12						May 12
Flicker		March 17	April 20		April 4	April 19	March 17
Yellow-bellied Sapsucker	May 10						May 10
Starling		March 27		March 21	April 4	March 11	March 11
Crow			April 7	March 21	April 4	April 10	March 21
Clark,s Nutcracker	April 5	July 11					April 5
Red-breasted Nuthatch		June 6					June 6
Mountain Bluebird	April 7		April 5		April 4	March 29	March 29
Horned Lark*	March 9	Feb 26	March 18	March 21	April 4	March 11	March 9
Robin	March 9	March 17		March 21	April 4	April 10	March 9
Catbird		June 6					June 6
Veery		June 7					June 6
Tree Swallow			May 14	April 14	April 11	April 11	April 11
Cliff Swallows			May 14			May 14	May 14
Rough-winged Swallow	April 13			April 18			April 13
Bank Swallow		July 11			April 19		April 19
Barn Swallow	May 2				May 9		May 2
House Wren		June 7				May 14	May 14
Rock Wren		June 6					June 6
Eastern Kingbird	May 12				May 31		May 12
Western Kingbird				April 15	May 17		April 15
Say's Phoebe	April 14	June 6	April 14	April 16		May 4	April 14
Western Wood Pewee		June 6					June 6
Common Grackle	May 1	May 1					May 1
Red-winged Blackbird	May 1		April 25		April 11		April 11
Brown-headed Cowbird	May 2	May 2					May 1
Meadowlark	May 1	April 16		March 24	April 4	April 20	March 24
Brewer's Blackbird			May 6	May 1		May 15	May 1

Species	1989	1990	1991	1992	1993	1994	Early Arrival
Yellow-rumped Warbler	May 12		May 15		May 8	April 23	April 23
Yellow Warbler		June 28					June 28
Dark-eyed Junco			April 25	March 30		April 10	March 30
Savannah Sparrow				May 1		April 23	April 23
Vesper Sparrow	May 2			May 1		April 23	April 23
Goldfinch		June 6					June 6

* Possibly winter resident or visitant